hydrocarbons, ozone and other atmospheric compounds to form NO_2. Globally, man-made and natural sources of nitrogen oxides are comparable in scale.

Effects

At high ambient concentrations, NO_2 has significant health effects as a pulmonary irritant, especially upon asthmatics and children. However, a much greater health concern in North Carolina is ozone, which is formed in the air when nitrogen oxides react with hydrocarbons on hot, sunny days.

Some types of vegetation are very sensitive to NO_2, including oats, alfalfa, tobacco, peas and carrots. Chronic exposure causes leaf yellowing (chlorosis) and acute exposure usually causes irregularly shaped lesions on leaves.

NO and NO_2 do not directly damage materials. However, NO_2 can react with moisture in the atmosphere to produce nitric acid, which corrodes metal surfaces and contributes to acid precipitation. Nitric acid is removed from the atmosphere by dry deposition, wet deposition (acid rain) or by further reaction with gaseous ammonia to form ammonium nitrate particulates.

Nitrogen oxides also can react photochemically with atmospheric hydrocarbons and radicals to form ozone, PAN (peroxy acetyl nitrate), and a host of other secondary pollutants.

Trends

NO_2 concentrations average 0.015 ppm across the state. Although NO_2 levels declined from the late 1970s to mid-1980s, concentrations have leveled off in recent years (**Figure 15**).